MATH 2404 – Ordinary Differential Equations I
Winter 2021

Instructor	Dr. David Amundsen
Email	dave@math.carleton.ca
Office Hours	Tuesday 10-11am or by appt.
Web page	http://mathstat.carleton.ca/∼dave/
Primary Resource (required)	*Mobius online learning platform* (https://www.digitaled.com/) class link: TBA – see CULearn
Supplemental Text (not required)	*Elementary Differential Equations* C.H. Edwards & D.E. Penney (Pearson)
Lectures	Tuesday and Thursday 8:30-10:00, online via Zoom (will be recorded).
Tutorials	Tuesday 16:30-17:30 online, platform TBA (starting Jan. 19)
TA	TBA
Problem Sets	Assigned weekly.
Midterm*	Tuesday, March 2.
Final*	Cumulative exam during exam period.
Deferrals	Accommodations for missed term work or final exam will be made in accordance with University Policy and may include alternate formats.
Grading	Tutorial/online Work: 10 % Problem Sets: 10 % Midterm: 25 % Final: 55 %

*- Please note that tests and examinations in this course will use a remote proctoring service provided by Scheduling and Examination Services. You can find more information at https://carleton.ca/ses/e-proctoring.

Accommodation Policies

- The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and **no later than two weeks before the first in-class scheduled test or exam requiring accommodation**. Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam.
- Accommodations for other reasons such as religious obligation, or parental leave, will be done only in accordance with University policy. These policies are administered by the office of Equity Services.

Topics and Schedule

1. Introduction (Module 1: 1 week)
    - Classification of ODEs
    - Applications to mathematical modeling
2. First Order ODEs (Module 2: 3 weeks)
    - Separable Equations
    - Linear Equations: Integrating factors
    - Nonlinear Equations: Substitution methods, Exact equations
3. Qualitative Methods (Module 3: 1 week)
    - Direction fields and graphical interpretation
    - Stability for first order autonomous equations
4. Second Order Linear ODEs (Module 4: 3 weeks)
    - Homogeneous, Constant coefficient
    - Nonhomogeneous, Constant coefficient: method of undetermined coefficients
    - General linear equations: methods of Reduction of Order, Variation of Parameters
5. Higher Order ODEs: Systems of Linear Equations (Module 6: 4 weeks)
    - Method of elimination
    - Matrix methods
    - Phase plane representation
    - Stability
    - Nonhomogeneous linear systems